

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: Martin Schrader

Title: SWITCHABLE LENS DISPLAY

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**PRE-APPEAL BRIEF REQUEST FOR REVIEW**

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In accordance with the New **Pre-Appeal Brief Conference Pilot Program**, announced July 11, 2005, this Pre-Appeal Brief Request is being filed together with a Notice of Appeal and with the required fee in response to the Final Office Action mailed April 29, 2009, and the Advisory Action mailed July 14, 2009.

**I. Rejection of Claims 26, 28-31, 33-36, 38, and 39 Under 35 U.S.C. § 102(b)**

On page 2 of the Final Office Action, Claims 26, 28-31, 33-36, 38, and 39 were rejected under 35 U.S.C. § 102(b) as being allegedly anticipated by U.S. Patent Publication No. 2001/0004279 to Sako *et al.* (hereinafter “Sako”). Applicant respectfully submits that *Sako* fails to disclose each and every element of at least independent Claims 26 and 33.

Independent Claim 26 recites in part:

an array of electrically controllable lenses positioned between the substrate layer and the pinhole mask to control the divergence of light received through the substrate and the lenses towards the pinhole mask, wherein the light is focused into a pinhole by a lens of the array of electrically controllable lenses to illuminate the associated pixel and is transmitted unfocused by the lens to darken the associated pixel

(Emphasis added). Independent Claim 33 recites, in part:

if it is determined to illuminate the pixel, controlling a lens of the array of electrically controllable lenses to focus the received light into a pinhole of an array of pinholes

(Emphasis added). Applicant respectfully submits that Sako fails to disclose an “array of electrically controllable lenses” and focusing “light into a pinhole” in order to “illuminate the pixel,” as in Claims 26 and 33.

A. Sako fails to disclose an “array of electrically controllable lenses.”

Independent Claim 26 recites in part “an array of electrically controllable lenses.<sup>”</sup> (Emphasis added). Independent Claim 33, although different in scope, recites a similar element. On page 2 of the Final Office Action, the Examiner asserted that “an array of electrically controllable lenses” is disclosed by reference numerals “104a+104b+105” of *Sako*. Applicant respectfully disagrees and submits that the Examiner misconstrues the plain language of the claims.

In column 5, lines 10-45, *Sako* states:

A reflection-type liquid crystal display device 1 includes a transparent upper substrate 103 having serrated protruding portions thereon and a transparent flat lower substrate 106. The upper substrate 103 has transparent upper electrodes 104a arranged on the protruding portions and the lower substrate 106 has transparent lower electrodes 104b crossing the upper electrodes 104a so that crossing parts of electrodes 104a and 104b define pixels P (FIG. 9). Each protruding portion of the upper substrate 103 has a surface downwardly inclined to define a prism. The lower substrate 106 has light reflection portions 107 and light absorption portions 108 on its lower surface. A liquid crystal layer 105 is sandwiched between the upper substrate 103 and the lower substrate 106.

Upon switching on or off of an electric field applied to the liquid crystal layer 105, liquid crystal molecules in the liquid crystal layer 105 are changed between a state in which the liquid crystal molecules are aligned perpendicular to the lower substrate 106 and a state in which the liquid crystal molecules are aligned parallel to the lower substrate 106.

Here, it is assumed that a refractive index  $n_g$  of the substrates 103, 106 and a refractive index  $n_o$  of the liquid crystal in the molecule short axis direction are agree with each other and a refractive index  $n_e$  of the liquid crystal in the molecule long axis direction satisfies  $n_e > n_o$ .

When the liquid crystal molecules are aligned perpendicular to the lower substrate 106, light incident on the upper substrate 103 goes straight on as shown by numeral 109 and is reflected

by the light reflection portions 107 and then goes outside the display device 1 through the upper substrate 103.

On the other hand, when the liquid crystal molecules are aligned parallel to the lower substrate 106, the light is deflected through the upper and lower substrates having the refractive index  $n_g$  and the liquid crystal layer having the refractive index  $(n_e+n_o)/2$  as indicated by an optical path 110. Then, the light goes to the light absorption portion 108 so that the light is absorbed and not irradiated to the outside.

(Emphasis added). As such, *Sako* discloses a display device having a liquid crystal layer. Depending on an applied electric field, molecules of the liquid crystal layer are aligned either perpendicular to or parallel to a lower substrate. When the molecules are aligned perpendicular to the lower substrate, light is allowed to freely pass through the liquid crystal layer. When the molecules are aligned parallel to the lower substrate, light is refracted or deflected so that it is absorbed by an absorption portion of the display device. As such, the liquid crystal layer of *Sako*, merely changes its refractive index to either allow the light to pass through the layer undisturbed or to deflect the light to an absorption portion.

A lens is a device that either converges light to or diverges light from a focal point. When the light is allowed to pass undisturbed through the liquid crystal layer of *Sako*, there is certainly no convergence or divergence of the light to or from a focal point. Similarly, when the light is deflected due to the altered refractive index of the liquid crystal layer, the light again does not converge to or diverge from a focal point. The uniform refractive index of the liquid crystal layer causes all of the light to uniformly deflect. Accordingly, the liquid crystal layer of *Sako* does not cause light to converge to or diverge from a focal point. Thus, the liquid crystal layer of *Sako* is not the same as a “lens,” as recited in Claims 26 and 33.

B. *Sako* fails to disclose focusing of light into a pinhole.

As seen above, Claim 26 recites, in part, “wherein the light is focused into a pinhole by a lens of the array of electrically controllable lenses to illuminate the associated pixel.” (Emphasis added). As also seen above, Claim 33 recites, in part, “if it is determined to illuminate the pixel, controlling a lens of the array of electrically controllable lenses to focus the received light into a pinhole.” (Emphasis added). Applicant respectfully submits that *Sako* fails to disclose these elements.

On page 2 of the Final Office Action, the Examiner asserted that:

*Sako* et al. disclose a display device comprising: . . . wherein the light is focused (such that it is made to travel straight to the pinhole) into a pinhole by a lens of the array of electrically controllable lenses to illuminate the associated pixel and is transmitted unfocused (light is allowed to continue on a slanted path and is substantially absorbed by the pinhole mask) by the lens to darken the associated pixel (for example, see Figs. 1 and 6).

As such, the Examiner appeared to assert that allowing light to travel undisturbed through a liquid crystal layer to a pinhole is the same as “focusing” the light into the pinhole with a lens. Applicant respectfully disagrees and submits that the Examiner misconstrues the plain claim language.

As discussed above, the liquid crystal layer 105 of *Sako* switches between two functionalities: 1) allowing the light to pass undisturbed through the liquid crystal layer; and 2) uniformly refracting or deflecting the light as it passes through the liquid crystal layer. (See column 5, lines 34-50). Applicant respectfully submits that allowing light to travel undisturbed through a layer is not the same as focusing the light “into a pinhole” using a “lens of the array of electrically controllable lenses.”

Focusing light includes converging the light toward a common focal point. In contrast and as discussed above, when the display device of *Sako* is to emit light, an electric field is applied to the liquid crystal layer causing the molecules of the liquid crystal layer to become aligned perpendicular to the substrate. (See column 5, lines 34-38). As such, light is allowed to pass undisturbed through the liquid crystal layer. (See column 5, lines 34-38). After passing undisturbed through the liquid crystal layer, the light is reflected off light reflection portions back through the liquid crystal layer, and is emitted from the display device. (See column 5, lines 34-38).

Thus, when the display device of *Sako* is to emit light, the light is simply allowed to pass undisturbed through the liquid crystal layer and reflect out of the display device. Nowhere in this process is any type of focusing of the light performed by the display device of *Sako*. As such, Applicant respectfully submits that *Sako* fails to disclose “wherein the light is focused into a pinhole by a lens of the array of electrically controllable lenses to illuminate the associated pixel,” as in Claim 26, and “if it is determined to illuminate the pixel, controlling a lens of the array of electrically controllable lenses to focus the received light into a pinhole,” as in Claim 33.

For at least these reasons, *Sako* fails to disclose each and every element of at least independent Claims 26 and 33. An anticipation rejection under 35 U.S.C. § 102 cannot be properly maintained where the reference cited fails to teach all of the recited claim elements. The remaining claims depend from one of Claims 26 and 33. As a result, Applicant respectfully requests withdrawal of the rejection of Claims 26-40 under 35 U.S.C. § 102(b).

## II. Rejection of Claims 27, 32, 37, and 40 Under 35 U.S.C. § 103(a)

On page 4 of the Final Office Action, Claims 27 and 37 were rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over *Sako* in view of U.S. Patent No. 5,623,361 to Engle (hereinafter “*Engle*”). On page 5 of the Final Office Action, Claims 32 and 40 were rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over *Sako* in view of U.S. Patent No. 5,608,554 to Do et al. (hereinafter “*Do*”). Both *Engle* and *Do* fail to cure the deficiencies of *Sako* with respect to independent Claims 26 and 33.

*Engle* is directed to a “wavefront phase modulator [that] utilizes a dielectric reflector affixed to a substrate.” (Abstract). However, *Engle*, alone or in combination with *Sako* and

*Do*, fails to disclose an “array of electrically controllable lenses,” or focusing “light into a pinhole” in order to “illuminate the pixel,” as in Claims 26 and 33.

*Do* is directed to a “display device” that includes a backlight, a polarizer, a pair of electrodes, an optoelectronic material, and a phosphor layer. (Abstract). However, *Do*, alone or in combination with *Sako* and *Engle*, also fails to disclose an “array of electrically controllable lenses,” or focusing “light into a pinhole” in order to “illuminate the pixel,” as in Claims 26 and 33.

In view of the foregoing, it is respectfully submitted that Claims 26-40 are in condition for allowance.

Respectfully submitted,

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